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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/647,534	08/26/2003	Anthony Dip	240579US6YA	2715

22850 7590 01/11/2005

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EXAMINER

MALDONADO, JULIO J

ART UNIT PAPER NUMBER

2823

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary

Application No.

10/647,534

Applicant(s)

DIP ET AL.

Examiner

Julio J. Maldonado

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 3-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/31/2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of claims 1-12 in the reply filed on 10/28/2004 is acknowledged. The traversal is on the ground(s) that "...the outstanding Restriction Requirement has not established that an undue burden would exist if the Restriction Requirement was not issued all of the claims were examined together. Moreover, the claims of the present invention would appear to be part of an overlapping area...". This is not found persuasive because the claims are classified in different areas in the art and therefore, different search is required, as established in the Office Action mailed on 09/28/2004.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 5, 6, 8, 10 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Gonzalez et al. (U.S. 6,194,327 B1).

Gonzalez et al. (Fig.1) teach a method of cleaning silicon substrate surfaces including the steps of growing a first layer of silicon oxide by thermal oxidation on the surface of the substrate; first etching said first oxide layer; growing a second silicon oxide layer by thermal oxidation; etching said second oxide layer; and repeating said oxidation and etching steps as desired until removing contaminant or substrate surface damage, wherein said etching steps are thermal vapor etching using H₂ and F₂ as etchants (column 2, line 55 – column 4, line 47).

4. Claims 1, 2, 5-7, 9 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Pai et al. (U.S. 6,764,967 B2).

Pai et al. (Fig.1) teach a method of removing defects from the surfaces of a plurality of silicon substrates including the steps of placing said substrates on a chamber; growing a first oxide layer on each of the surfaces of the substrates; etching said first oxide layer; growing a second oxide layer on each of said surfaces of said substrates; etching said oxide layer from each of the surfaces of the substrates, wherein said etching steps are wet etching steps; forming an additional layer on one of said first and second oxide layer using thermal oxidation; and repeating said oxidation and said etching steps until said defects are removed (column 3, line 39 – column 5, line 59).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pai et al. (U.S. 6,764,967 B2) as applied to claims 1, 2, 5-7, 9 and 12 above, and further in view of the following comments.

Pai et al. teach forming the first oxide layer having a thickness of less than about 10Å and forming the second oxide layer having a thickness of 5Å to 100Å (Pai et al., column 4, lines 1 – 6 and column 5, lines 29 – 32). Pai et al. fail to expressly teach forming the oxide layer having a thickness between approximately 5Å and 15Å. However, in the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists. MPEP 2144.05. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the recited thickness range to arrive at the claimed invention.

7. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pai et al. (U.S. 6,764,967 B2) as applied to claims 1, 2, 5-7, 9 and 12 above, and further in view of Herbots et al. (U.S. 6,613,677 B1).

Pai et al. (Fig.1) teach a method of removing defects from the surfaces of a plurality of silicon substrates including the steps of placing said substrates on a chamber; growing a first oxide layer on each of the surfaces of the substrates, wherein said first oxide has a thickness of less than about 10Å; etching said first oxide layer; growing a second oxide layer on each of said surfaces of said substrates, wherein said oxide has a thickness between approximately 5Å and 100Å; etching said oxide layer from each of the surfaces of the substrates, wherein said etching steps are wet etching steps; forming an additional layer on one of said first and second oxide layer using

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thermal oxidation; and repeating said oxidation and said etching steps until said defects are removed (column 3, line 39 – column 5, line 59).

Pai et al. fail to teach monitoring said surface region of the surface using high resolution transmission electron microscopy (HRTEM) data. However, Herbots et al. in a method of forming and etching oxide layers on a silicon substrate teach using HRTEM to determine thickness of layers and interfaces between said silicon substrate and said oxide layer (column 9, lines 15 – 32). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Pai et al. and Herbots et al. to enable monitoring the surface of the substrate in order to determine thickness of the oxide layer as taught by Pai et al.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Julio J. Maldonado whose telephone number is (571) 272-1864. The examiner can normally be reached on Monday through Friday.

9. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached on (571) 272-1855. The fax number for this group is 703-872-9306 for before final submissions, 703-872-9306 for after final submissions and the customer service number for group 2800 is (703) 306-3329.

Updates can be found at <http://www.uspto.gov/web/info/2800.htm>.

Julio J. Maldonado
Patent Examiner
Art Unit 2823

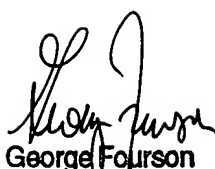
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Julio J. Maldonado

January 7, 2005


George Fourson
Primary Examiner